

AMENDMENT TO THE CLAIMS

1. (Currently Amended) A ground-plane for an antenna device characterized in that said ground-plane includes at least two conducting surfaces, said ~~two~~ conducting surfaces being connected by at least a one conducting strip which allows current to flow from one ~~conductive~~ conducting surface to another, said strip being narrower than the width of any of said ~~two~~ conducting surface surfaces.
2. (Currently Amended) A ground plane for an antenna device according to claim 1, wherein said conducting surfaces are ~~laying over on~~ a common planar or curved surface.
3. (Currently Amended) A ground-plane for an antenna device according to claim 1 ~~or 2~~, wherein two edges of at least two conducting surfaces are placed substantially parallel to each other, and said at least one conducting strip connecting said ~~two~~ conducting surfaces is placed substantially centered with respect to the gap defined by said two substantially parallel edges.
4. (Currently Amended) A ground-plane for an antenna device according to claim 1, ~~2, or 3~~, wherein the ground-plane includes at least three conducting surfaces, in which one pair of any of two adjacent conducting surfaces are connected by means of at least a one conducting strip, and the ~~rest~~ remaining pairs of adjacent conducting surfaces are electromagnetically connected by means of a capacitive effect or by direct contact provided by the at least one conducting strip.
5. (Original) A ground-plane for an antenna device according to claim 4, wherein said strips are substantially aligned along a straight axis.
6. (Original) A ground-plane for an antenna device according to claim 4, wherein said strips are not aligned along a straight axis.

7. (Currently Amended) A ground-plane for an antenna device according to claim 1, ~~2, or 4~~, wherein it said antenna device includes at least two conducting strips, both strips connecting at least two of said conducting surfaces at least at two points located at both edges of said conducting surfaces.

8. (Currently Amended) A ground-plane for an antenna device according to claim 1, ~~2, 4, 6, or 7~~, wherein at least one of said strips is aligned along one of the edges defining an ~~the~~ external perimeter of said ground-plane.

9. (Currently Amended) A ground-plane for an antenna device according to claim 2, said ground-plane comprising a plurality of conducting surfaces ~~laying~~ on the same planar or curved surface, wherein at least two of said conducting surfaces are connected by means of a conducting strip.

10. (Currently Amended) A ground-plane for an antenna device according to claim 1, ~~2, 3, 4, 5, 6, 7, 8, or 9~~, wherein each two couple of adjacent conducting surfaces are connected by means of at least a one conducting strip.

11. (Currently Amended) A ground-plane for an antenna device according to claim 1, ~~2, 3, 4, 5, 6, 7, 8, 9, or 10~~, wherein all the conducting surfaces defining said ground-plane have a substantially rectangular shape, said rectangular shapes being sequentially aligned along a straight axis, each pair of rectangular shapes defining a gap between them, at least two a couple of opposite edges of at least one of said gaps being connected by at least a one conducting strip.

12. (Currently Amended) A ground-plane for an antenna device according to claim 1, ~~2, 4, 6, 8, 9, 10, or 11~~ wherein all the conducting surfaces defining said ground-plane have the same horizontal width and are sequentially aligned along a straight vertical axis, wherein each pair of adjacent conducting surfaces define a gap between them, wherein each pair of adjacent conducting surfaces are connected across said

gap by means of a conducting strip, said strip being aligned along an edge of the external perimeter of said ground-plane, said edge being alternatively and sequentially chosen at the right and left sides with respect to a ~~of~~ vertical axis crossing the center of the ground-plane.

13. (Currently Amended) A ground-plane for an antenna device according to claim 1, ~~2, 3, 4, 5, 6, 7, 8, 9, 10, 11, or 12~~, wherein at least one of the strips connecting two of said conducting surfaces is shaped as a zigzag or meandering curve.

14. (Currently Amended) A ground-plane for an antenna device according to claim 1, ~~2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, or 13~~, wherein at least one of the conducting surfaces, ~~and/or~~ or at least one of the conducting strips of said ground-plane is shaped as a space filling curve ~~Space Filling Curve~~ (SFC), being said SFC ~~Space Filling Curve~~ including composed by at least ten connected straight segments, wherein said segments are smaller than a tenth of the operating free-space wave length and ~~they~~ are spatially arranged in such a way that no two ~~none~~ of said adjacent and connected segments form another longer straight segment.

15. (Currently Amended) A ground-plane for an antenna device according to claim 14, wherein said segments intersect ~~to each other~~ at the tips of the SFC curve.

16. (Currently Amended) A ground-plane for an antenna device according to claim 14 ~~or 15~~ wherein the SFC includes a plurality of corners formed by each pair of ~~said~~ adjacent segments, the plurality of corners each being ~~are~~ rounded ~~or smoothed otherwise~~.

17. (Currently Amended) A ground-plane for an antenna device according to ~~any of the~~ claim 14, ~~to 16~~ wherein the SFC curve is periodic along a fixed straight direction of space only if, and only if, the period

is defined by a non-periodic curve that includes composed by at least ten connected segments and no pair of said adjacent and connected segments define a straight longer segment.

18. (Currently Amended) A ground-plane for an antenna device according to claim 14, wherein at least one portion of the antenna device or its parts is shaped as a SFC, wherein said SFC has features a box-counting dimension larger than one, being said box-counting dimension being computed as usual as the slope of the straight portion of a log-log graph, wherein such a straight portion is substantially defined as a straight segment over at least an octave of scales on the horizontal axis of the log-log graph.

19. (Currently Amended) A ground-plane for an antenna device according to any of the claims claim 14 ~~to 18~~, wherein at least one portion of the antenna device or its parts is shaped either as a Hilbert, Peano, SZ, ZZ, HilbertZZ, Peanoinc, Peanodec, or PeanoZZ curve.

20. (Currently Amended) A ground-plane for an antenna device according to any of the claims claim 14 ~~to 18~~, wherein at least one of the strips connecting two ~~of said~~ conducting surfaces is shaped as a an SFC.

21. (Currently Amended) A ground-plane for an antenna device according to any of the claims claim 1, ~~to 20~~ wherein at least one of the gaps between at least two of said conducting surfaces are connected by two or more includes at least two conducting strips of different length.

22. (Currently Amended) A ground-plane for an antenna device according to any of the claims claim 14, ~~to 20~~ wherein at least a portion of the gap between at least two of said conducting surfaces define a gap, at least a portion of the gap being defining the ground plane is shaped as a an SFC.

23. (Currently Amended) A ground-plane for an antenna device according to ~~any of the claims~~ claim 14, to 22 wherein at least half of the surface area of 50% of surface covered by said ground-plane is formed by filled out by means of a strip, said strip being shaped as a an SFC.

24. (Currently Amended) A ground-plane for an antenna device according to ~~any of the claims~~ claim 1 to 23, wherein at least a portion of ~~the geometry of~~ said ground-plane is a multilevel structure, said multilevel structure including a set of conducting polygons, ~~all of~~ said polygons each having featuring the same number of sides, wherein said polygons are electromagnetically coupled ~~either~~ by means of either a capacitive coupling or ohmic contact, wherein a the contact region between directly connected polygons is narrower than half ~~50%~~ of the perimeter of said polygons in at least seventy-five percent ~~75%~~ of said polygons defining said conducting ground-plane.

25. (Currently Amended) A ground-plane for an antenna device according to ~~any of the claims~~ claim 1 to 24, wherein ~~the shape of~~ the perimeter of said ground-plane, ~~the shape of~~ the conducting surfaces, or both the perimeter of said ground plane and the conducting surfaces ~~kinds of elements included in said ground plane~~ are square, rectangular, triangular, circular, semi-circular, elliptical, or semi-elliptical.

26. (Currently Amended) A ground-plane for an antenna device according to claim 1, the preceding claims, wherein the antenna device is included in a handheld wireless device.

27. (Currently Amended) A ground-plane for an antenna device according to claim 1 any of the claims 1 to 25, wherein the antenna device includes is a microstrip patch antenna.

28. (Currently Amended) A ground-plane for an antenna device according to claim 1 any of the claims 1 to 25, wherein the antenna device includes a ~~is a Planar Inverted F Antenna~~ planar inverted-F antenna (PIFA).

29. (Currently Amended) A ground-plane for an antenna device according to claim 1 ~~any of the claims 1 to 25~~, wherein the antenna device ~~is~~ includes a monopole antenna.

30. (Currently Amended) ~~An~~ A ground-plane for an antenna device ~~including a ground plane~~ according to claim 1 ~~any of the preceding claims~~, wherein the antenna device is smaller than a half of the free-space operating wavelength.

31. Cancelled.

32. Cancelled.

33. (Currently Amended) A ground plane for an ~~An~~ antenna device according to claim 1 ~~any of the claims 1 through 32~~, wherein the antenna device includes a multiband antenna, ~~features a multiband behavior~~.

34. (Currently Amended) A ground plane for an ~~An~~ antenna device according to claim 1 ~~claims 24, 25, 26, 27, 28, or 29~~, wherein the antenna device is used to provide coverage in ~~micro-cells or pico-cells a cellular network, a wireless local area network (WLAN) or both~~, ~~at least one of the cellular systems AMPS, GSM900, GSM1800, PCS1900, UMTS, CDMA, or at least a WLAN system such as IEEE 802.11, Bluetooth, or a combination of them~~.

35. (Currently Amended) A ground plane for an ~~An~~ antenna device according to claim 1 ~~any of the claims 27 to 32~~, wherein the antenna device is mounted inside ~~a~~ the rear-view mirror of a motor vehicle to provide coverage in a cellular network, a wireless local area network (WLAN) or both, ~~to at least one of~~

~~the cellular systems AMPS, GSM900, GSM1800, PCS1900, UMTS, CDMA, or at least a WLAN system such as IEEE802.11, Bluetooth, or a combination of them.~~

36. (Currently Amended) A ground plane for an An antenna device according to claim 1 any of the claims 27-32, wherein the antenna device is mounted inside a the keyless door lock operation device.

37. (Currently Amended) A ground plane for an An antenna device according to claim claims 1 through 25, characterized in that said antenna device includes a the radiating element having has substantially the same shape as the ground-plane, said radiating element being located placed parallel or orthogonal to said ground-plane.

38. (New) A ground plane for an antenna device according to claim 1, wherein the antenna device is included in a cellular telephone, a cordless telephone, a personal digital assistant (PDA), a wireless paging device, an electronic game device or a remote control.

39. (New) A ground plane for an antenna device according to claim 1, wherein the ground-plane is included in a handheld wireless device and wherein the antenna device includes a microstrip patch antenna configuration or a planar inverted-F (PIFA) antenna configuration.